

Fig. 1 A see through view of a LCD panel and its ITO electrodes

Charge Conserving Passive LCD Driving Scheme

Page 2 of 5

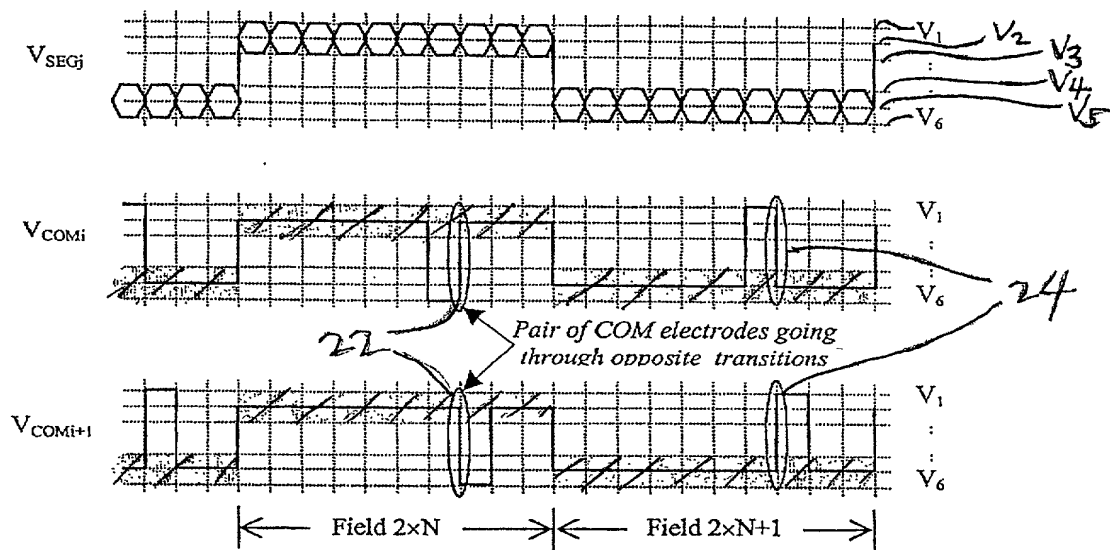


Fig. 2 Wave forms for COM electrodes and SEG electrodes

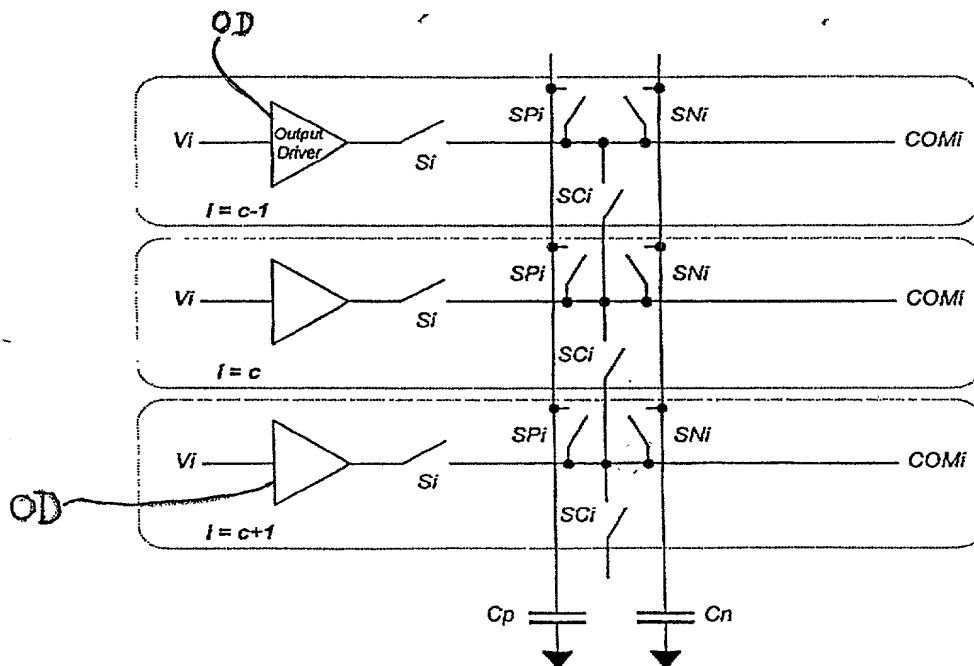


Fig. 3 Schematics for portion of the control circuit related to the present invention

Transition	Positive going				Negative going			
Time	t0	t1	t2	t3	t0	t1	t2	t3
SPi			X		X			
SCi		X				X		
SNi	X						X	
Si				X				X

Fig. 4 Relationship between COM signal transition and the operations of switch SPi, SNi, SCi, and Si (X: close, blank: open)

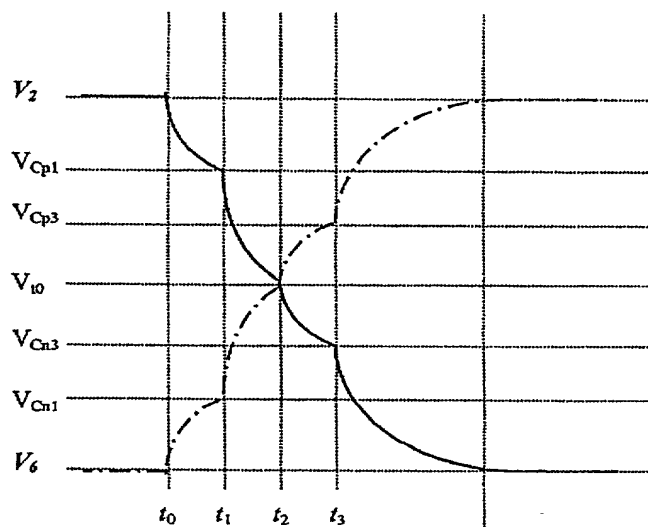


Fig 5. Detailed COM electrode waveform corresponding to the oval circle in Fig. 2 and the switch action sequence in Fig. 4. The solid line and the dotted line are the waveforms of a pair of COM electrodes going through opposite transitions (e.g. V_{COMi} and V_{COMi+1}).

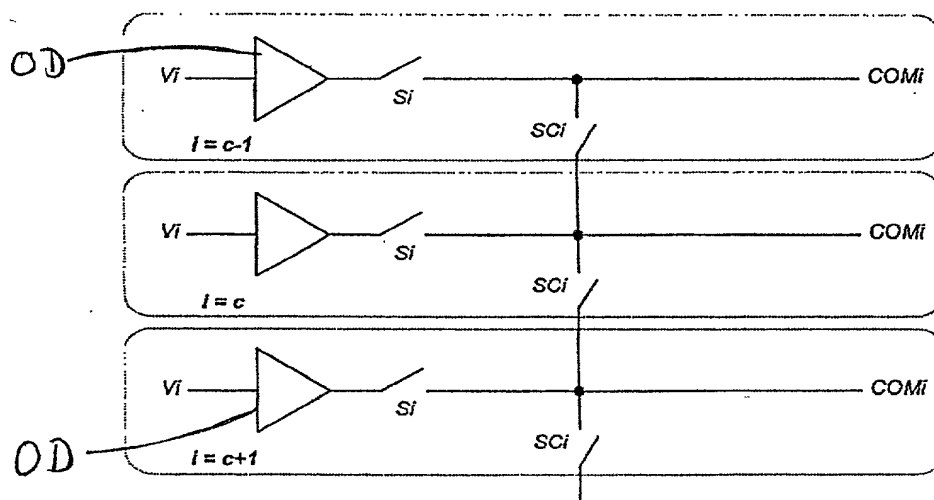


Fig. 6 Schematic for simplified alternative implementation.
No switch SP_i , SN_i , and no storage capacitors C_p , C_n

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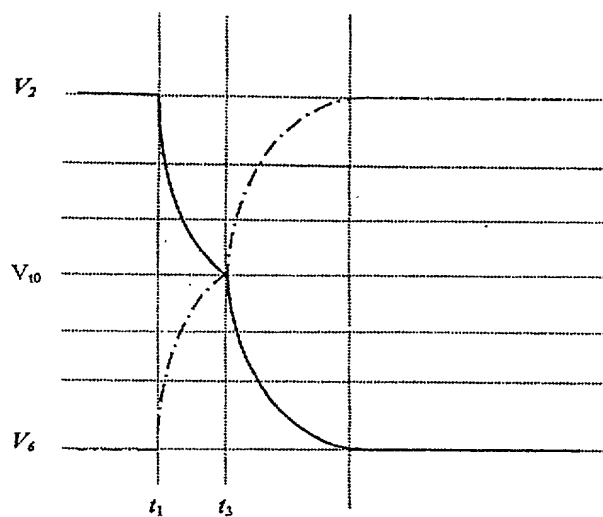


Fig. 7 Waveform for the alternative implementation.

An example of 3-line inversion Wave forms

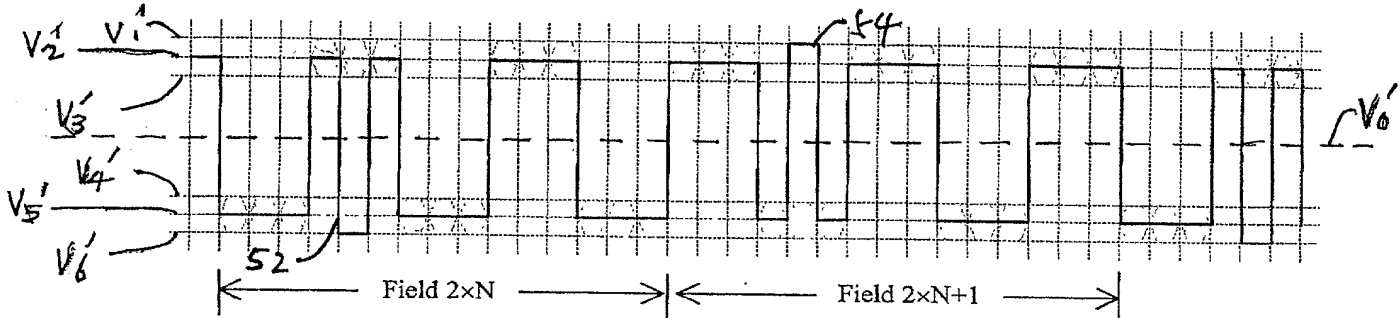


FIG. 11

Circuit Schematics and Operation

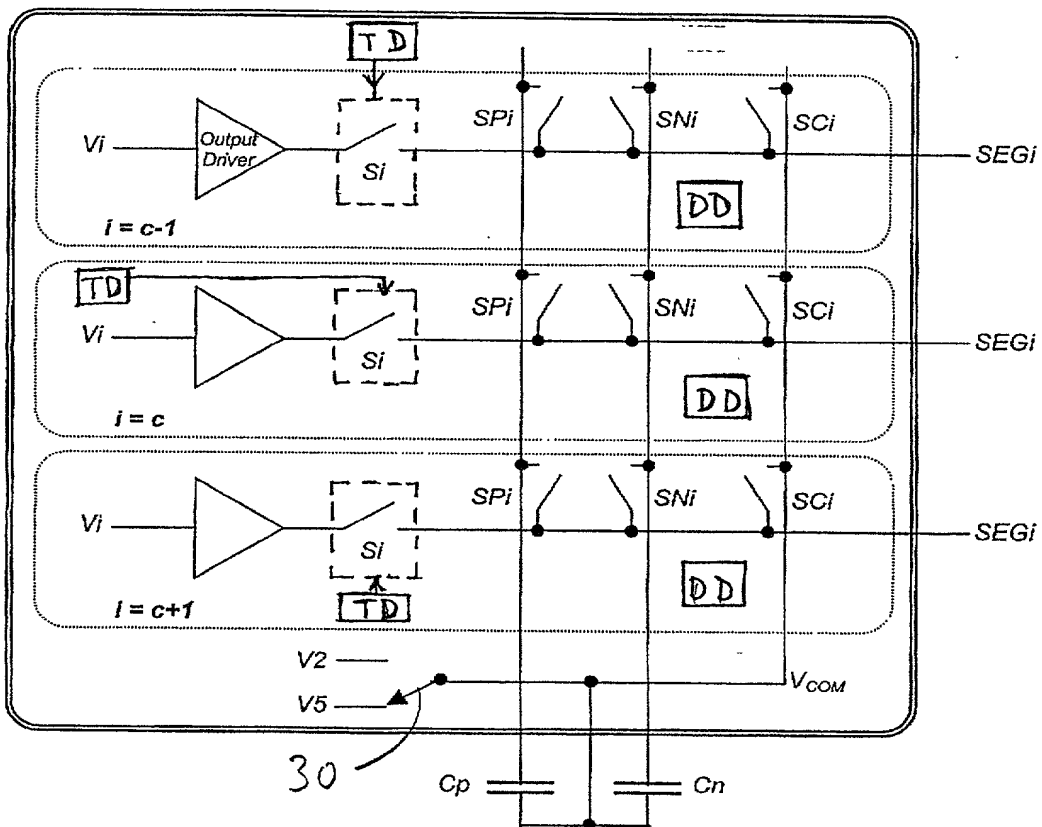
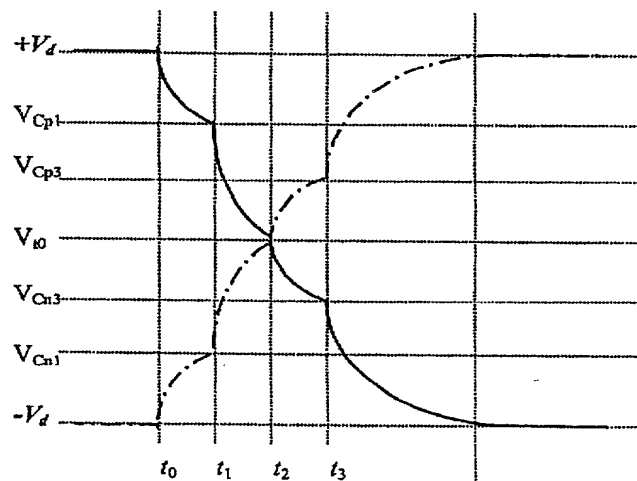


FIG. 8

Transition	Positive going (TD=1, DD=1)				Negative going (TD=1, DD=0)			
Time	t0	t1	t2	t3	t0	t1	t2	T3
SPi			X		X			
SCi		X				X		
SNi	X						X	
Si				X				X

Relationship between $V_{SEG}-V_{COM}$ transition and the operations of switch SPi, SNi, SCi, and Si (X: CLOSE, blank: OPEN). When TD=0, then S is always CLOSE, while SP, SN, SC are always OPEN.

Fig. 9



Detailed $V_{SEG} - V_{COM}$ wave forms corresponding to the switch action sequence in Fig. 9. The solid line illustrates a negative going transition and the dotted line illustrates a positive going transition. The value of V_{t0} depends on the mixture of "matching" transitions (as discussed in the following paragraph) and may not be near the mid-point between V_{Cp1}/V_{Cp3} and V_{Cn1}/V_{Cn3} , as may appear to be implied in the above figure.

FIG. 10

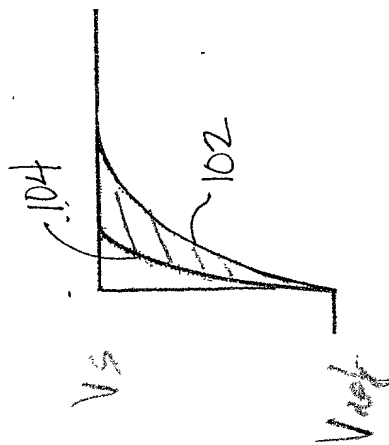


FIG. 12A

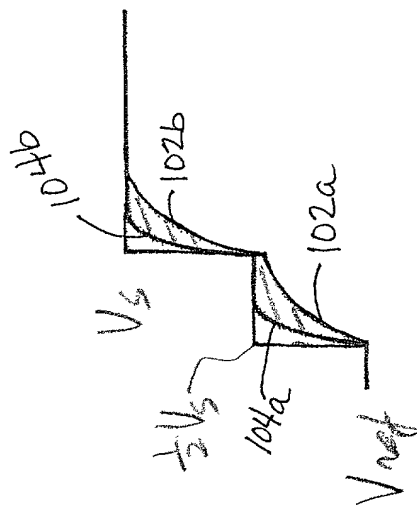


FIG. 12B

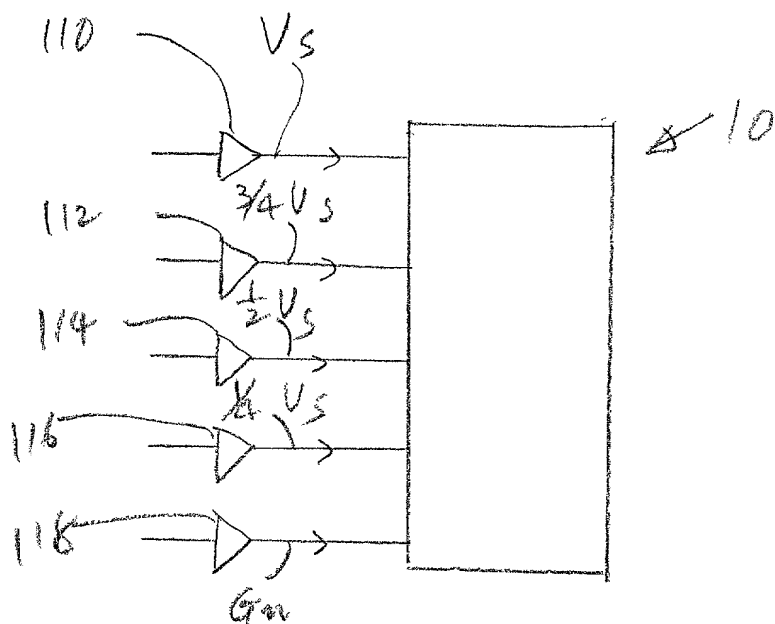


FIG. 14

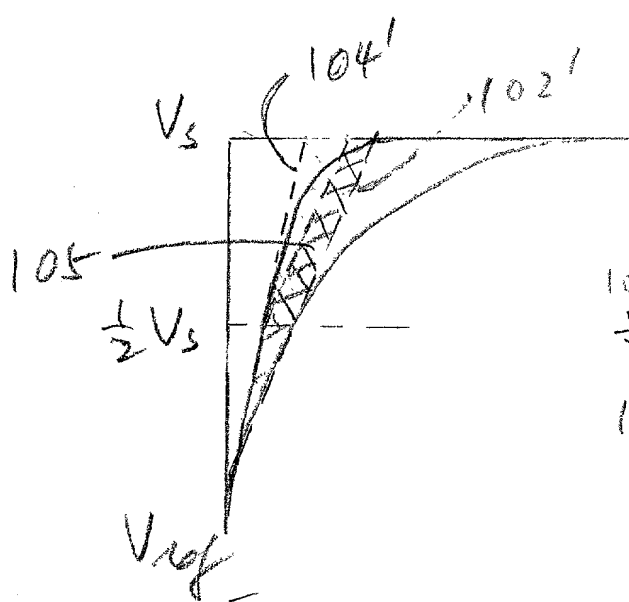


FIG. 13A

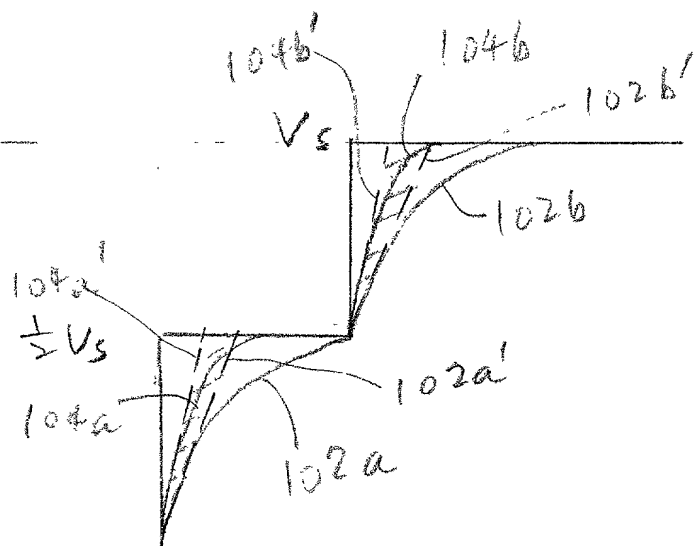


FIG. 13B